

MISSOURI CONSERVATIONIST

VOLUME 84, ISSUE 2, FEBRUARY 2023
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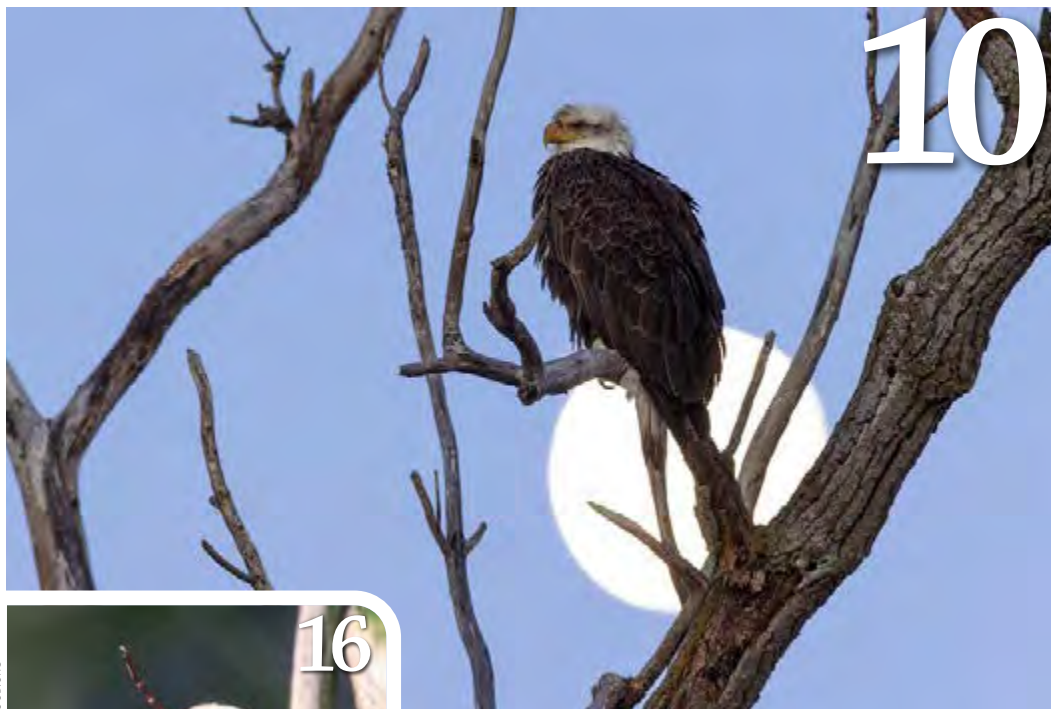
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MISSOURI CONSERVATIONIST



ON THE COVER

Eastern bluebird

📷 NOPPADOL PAOTHONG

500mm lens, f/16
1/1000 sec, ISO 400

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Letters to the Editor

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PICTURE PERFECT

The *Through Your Lens* [December, Page 10] photos are absolutely amazing! Our Missouri photographers rival any of those from major magazines, like *National Geographic*. Please show more. They're such a delight.

Ann Telthorst
via email



THROUGH YOUR LENS

I do love every issue of the *Missouri Conservationist* we receive, but the December issue containing *Through Your Lens* was exceptional. I always enjoy the professional pictures in all of the issues. However, seeing pictures taken by Missouri readers was such a treat. The pictures were, as you said, worth well over a thousand words.

The first photograph, coyote vs. trumpeter swan, had me laughing and I knew I was in for something special with the rest of the reader photos. I would be hard pressed to pick a favorite, but I have looked at the southern painted turtle and diamond-backed watersnake over and over. I think this picture is beautiful in color, subject matter, and action. They both seem intrigued by something that has their attention.

Ramona Allen Sedalia

Thank you so much for a magazine full of absolutely wonderful pictures. The beauty of Missouri and its treasures that you shared allows so many of us to see the beauty we have missed.

D. Duncan Troy

Eighteen pages of Missouri wildlife and scenery. This is a splendid display of photographic excellence and a wonderful reminder of just how fortunate we are to live in Missouri if we just look around us. A big thank you to the editors for this treasure trove.

Paul McMasters Springfield

SMOKING HOT

Thank you for the interesting article about fire towers in Missouri [*Shooting the Smoke*, July, Page 22]. I have tried to climb them, where allowed, but my fear of heights has always kept me from passing the first step. I hope to succeed at least once. I'm sure the view is breathtaking

Mark Forster Lee's Summit

FOR THE LOVE OF BATS

I would just like to thank you for looking out for bats [*Nature Lab*, October, Page 4]. These endangered creatures do more for us than one might know. I see them as a gift.

Hendrix Meyer Perryville

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The Missouri Department of Conservation protects and manages the fish, forest, and wildlife of the state. We facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.



Want to see your photos in the Missouri Conservationist?

Share your photos on Flickr at
flickr.com/groups/mdcreaderphotos-2023
or email Readerphoto@mdc.mo.gov.



1 | Dekay's
brownsnake by
Sharon Kosa,
via email

2 | Winter pond
fishing by
So Bodley,
via email

3 | Coyote by
Doug Thomas,
via Flickr



Want another chance to see your photos in the magazine?

➔ In the December issue, we plan to feature even more great reader photos. Use the submission methods above to send us your best year-round pictures of native Missouri wildlife, flora, natural scenery, and friends and family engaged in outdoor activities. Please include where the photo was taken and what it depicts.



Up Front

with Sara Parker Pauley

✱ I love a good comeback story — just when you think all hope is gone, the underdogs rise from the dust to remind you that one should never ever give up hope. Cue movies like *Rocky* — I'm in.

Our country's conservation history is rich with such stories — the founding of the Missouri Department of Conservation by our citizenry in the 1930s just as wildlife was at its low point; or in the early 1970s, when the environmental movement rose to combat dangerous pollution in our air and waterways. About the same time, the use of pesticides like DDT and loss of habitat contributed to the drastic decline of the bald eagle and other species, leading the public and Congress to respond, including passage of the Endangered Species Act (ESA). Signed into law 50 years ago by Richard Nixon, the president told the nation, "Nothing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed." Cue the image of the American flag with a bald eagle.

Fifty years later we've seen some real successes with the ESA (see *Flying High*, Page 10), but darkness looms still. Over 12,000 species are in decline nationally, with more than a thousand in decline in Missouri alone. And these numbers are growing. Our wildlife need us now more than ever, just as we need them.

Cue the *Rocky* theme song. This story is far from over.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
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Nature LAB

by Dianne Van Dien

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

FISHERIES MANAGEMENT

Watching for Pathogens at Fish Hatcheries

✳ Each year MDC stocks an average of 4.6 million fish of various species in rivers and lakes across the state. To be released into the wild, these hatchery-raised fish must be healthy.

“We want to be good stewards of the resource and not perpetuate any diseases or introduce any new pathogens into Missouri’s waters,” explains MDC Aquatic Animal Health Specialist Larry Durham.

MDC’s nine hatcheries all follow best management practices. Most fish stay healthy, but when they don’t, staff have protocols for detecting pathogens (bacteria, viruses, and parasites). Hatchery staff watch the behavior, appearance, and eating patterns of the fish. If something looks off, they call Durham.

“I check the fish for any abnormalities in their organs or on the skin, gills, or eyes,” says Durham. “I look mainly for bacteria or parasites because those are the things we can treat. If we suspect a virus, samples are sent to a federal lab for testing.”



MDC Aquatic Animal Health Specialist Larry Durham views bacteria stained purple with Gram stain. The bacteria’s shape, their color after the Gram-staining procedure, and the species of fish they were found in are among the many factors used to identify them.

MDC staff keep hatchery fish healthy through monitoring and prevention

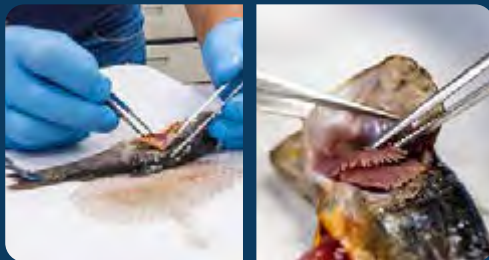
Often fish can be treated with medicated food or by adding treatments to the water to kill bacteria and parasites. If an outbreak isn’t treatable and is causing major loss, the fish may be euthanized, and the rearing units are disinfected.

In addition to diagnosing and treating infections, Durham and staff conduct inspections. Twice a year, 175 fish are sampled from each trout hatchery and tested for specific fish pathogens.

“By keeping records of when and where pathogens occur, we can assess hatchery practices to look for where we can improve,” says Durham. “Accurate documentation allows us to see patterns and make better predictions. Hatchery management can then be altered to reduce or eliminate the problem. Ultimately, prevention is key for fish health management.”

Watching for Pathogens at Fish Hatcheries at a Glance

MDC hatcheries are managed to prevent the spread of pathogens (bacteria, viruses, parasites). If hatchery fish die or show signs of being sick, they are checked both externally and internally to determine the cause. After a diagnosis is made, staff treat the fish as fits the situation.



Skin, eyes, and gills are examined as well as internal organs.



Trout gills infected with *Flavobacterium branchiophilum*, a common cause of bacterial gill disease. (100x magnification)

In Brief

News and updates from MDC



Get ready for squirrel hunting season by renewing your annual permit.

2023 HUNTING AND FISHING PERMITS ON SALE

DON'T BE CAUGHT UNPREPARED — PURCHASE YOUR NEW YEAR'S PERMITS NOW

➔ MDC reminds Missouri hunters and anglers that related annual permits expire at the end of February, including 2022 permits for small game, fishing, trout fishing, and combination hunting and fishing.

Buy Missouri hunting and fishing permits from vendors around the state, online at mdc.mo.gov/buypermits, or through our free mobile apps, MO Hunting and MO Fishing, available for download through Google Play for Android devices or the App Store for Apple devices.

Save time by buying hunting and fishing permits for multiple people in a single transaction. Select the "Additional Customer" option during the permit purchase.

Commercial and lifetime permits can be purchased only through the MDC Permit Services Unit by calling 573-522-0107 for an application.

APPLY ONLINE FOR SPRING MANAGED TURKEY HUNTS STARTING FEB. 1

Missouri turkey hunters can apply online during the month of February for 2023 spring turkey managed hunts at short.mdc.mo.gov/4xz. Managed hunt details and application procedures are outlined on the webpage. Drawing results will be posted starting March 15.

Spring turkey hunting youth weekend will be April 1 and 2 with the regular spring season running April 17 through May 7. Learn more about turkey hunting in Missouri at short.mdc.mo.gov/Ztu.

"WOODY THE SINGING FORESTER" INDUCTED INTO CONSERVATION HALL OF FAME

MDC recently honored Herschel "Woody the Singing Forester" Bledsoe posthumously by inducting him into the Missouri Conservation Hall of Fame. Bledsoe died in 1991 at age 67. He is the 46th inductee.

Bledsoe began his career with MDC in 1942 as a towerman and firefighter and came to be known as "Woody the Singing Forester" for his musical entertainment promoting forestry conservation and the dangers of wildfires. He was also the voice of Smokey Bear in Missouri in the 1950s and 1960s and made hundreds of personal appearances with an animated Smokey at county fairs throughout the state. Bledsoe also produced and hosted our *Missouri Outdoors* television show in the early 1960s. The popular show aired until 2007 with episodes still available online.

Listen to the "Singing Forester" through our vintage video circa 1960 at short.mdc.mo.gov/4xa. Learn more about Woody at short.mdc.mo.gov/4NL.



MDC and the Missouri Conservation Commission recently honored Herschel "Woody the Singing Forester" Bledsoe posthumously by inducting him into the Missouri Conservation Hall of Fame. Shown is Bledsoe (far right) with other musicians circa 1960.

Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov or call 573-522-4115, ext. 3848.

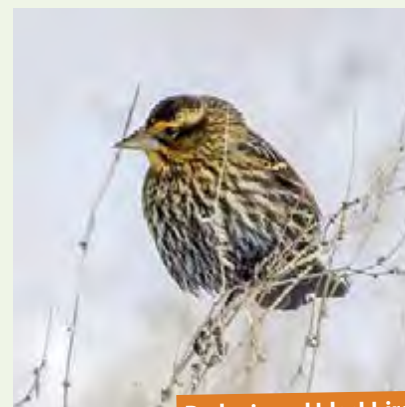
Q: Do red-winged blackbirds live in Missouri year-round?

➔ These common, permanent residents are widespread and abundant in Missouri. Streaky females are well-camouflaged for reedy nesting habitats, unlike the black males with their red wing patches.

This species prefers marshes, moist grasslands, and wet roadside ditches. They are often visible in reedy ditches along Missouri's roadways. In late summer and fall, they are often present in large flocks in crop fields. During migration and in winter, red-winged blackbirds roost at night in cattails and other tall emergent marsh vegetation, or with other blackbirds in tree roosts that may include millions of individuals. On winter mornings, these large roosts spread out, foraging as far as 50 miles for food before reforming in flocks at night.

They are considered by some observers to be the most abundant bird in North America.

Q: A neighbor observed a single deer approaching a group of 30 Canada geese and slowly encircling the flock. He said it almost looked like herding behavior. The deer then walked into the center and scattered the geese to flight. A single goose did confront the deer



Red-winged blackbird

and the deer jumped over it. The geese were grazing on a patch of grass at our local park. Can you help explain what happened?

➔ It is likely the deer was attempting to scare the geese away from the patch of grass, clover, or weeds they were occupying so that it could feed. And in turn, the geese were defending their food source. In the dead of winter, there is little for deer or other herbivores to eat, making for fierce competition over what little food can be found. Clover and other weedy plants are still green this time of year and can be found in open spaces. This food source would be attractive to both deer and geese. Canada geese can be aggressive; presumably, this was not the deer's first run-in with them, due to the level of caution displayed by the deer.

RED-WINGED BLACKBIRD: IVAN EDSON; ORIOLE NEST: TERRIE MERRITT



Oriole nest

Q: Every summer I have pairs of Baltimore and orchard orioles attracted to my bird feeders in my yard. For years I've searched for a nest, which should be visible in the winter. I think I've finally found one — not 15 feet from my deck. Can you identify this nest for me?

➔ Both Baltimore and orchard orioles weave sock-like, pendulous nests near the tips of tree branches. Although no knots are tied, the bird's random poking tangles the fibers. Males might bring materials, but only the female does the weaving. Fibers from old nests are sometimes recycled.

Orchard orioles' nests often are hidden in a tree's green leaves and Baltimore orioles tend to anchor their



Baltimore oriole

Orchard oriole

nests from the fork of a tree's slender upper branches. Both species' nests are woven of long green grass blades and lined with fine grass, plant fuzz, and feathers. Orchard orioles tend to build their nests more quickly than Baltimore orioles.

Since these two species' nests are very similar, it's tough to determine your nest's original builder. However, to find out which species may be nesting near you, we recommend looking for nests during breeding season. By watching birds come and go, you may be able to better pinpoint which species might be weaving which nests in your vicinity. Male Baltimore orioles have a flame-orange breast, whereas the breast of the orchard oriole is reddish-chestnut. Females of both species are yellowish.



Corporal Eric Long

REYNOLDS COUNTY
CONSERVATION AGENT

offers this month's

AGENT ADVICE

Crow hunting is an enjoyable and often overlooked hunting season. Missouri's crow season runs from Nov. 1 to March 3. During that time, crows can be taken in any number by shotgun, rifle, handgun, archery, and falconry. Hunters are required to possess a small game hunting permit. Crow hunters will be most successful early in the morning or late in the evenings near roosting or feeding areas, such as cattle pastures. The use of electronic calls, combined with decoys, will attract crows within shooting range. The sounds of feeding crows and owls hooting seem to be most effective in luring large groups. For more information, visit short.mdc.mo.gov/4xJ.

What IS it?

Can you guess this month's natural wonder?

*The answer is on
Page 9.*



SPECIES OF *Conservation Concern*



ENDANGERED

Scaleshell

by Steve McMurray

The U.S. Fish and Wildlife Service (USFWS) listed the scaleshell, a medium-sized freshwater mussel, as a federally endangered species in 2001. Scaleshell historically inhabited 56 rivers of the Mississippi River basin from Alabama to Oklahoma, north to Canada and Ohio. Scaleshell is now limited to 18 streams across its historic range but can only be consistently found in three rivers in Missouri — the Gasconade, Meramec, and Bourbeuse rivers.



Mussels act as nature's "vacuum cleaners," filtering and cleansing polluted waters.

WHY IT'S IMPERILED

As with all rare freshwater mussels, scaleshell have declined due to reduced water quality, sedimentation, channel destabilization, altered stream hydrology, and habitat destruction. Scaleshell use freshwater drum as a host species during a portion of their life cycle, so any threats to freshwater drum or barriers to fish movement would also indirectly affect scaleshell.

MDC RESTORATION EFFORTS

Working cooperatively with partners at the USFWS and Missouri State University, methods were developed to be able to artificially propagate scaleshell in a laboratory or hatchery. Working cooperatively with USFWS and researchers at Iowa State University, research was conducted to understand the genetics of scaleshell populations in Missouri.

WHAT CAN YOU DO?

Avoid activities that reduce water quality, encourage natural stream flows and streamside vegetation, and follow best management practices for projects near streams. Reestablish protective riparian corridors and stabilize streambanks to reduce sedimentation, control nutrient enrichment of nearby waterways, and exclude livestock from streams.

WINTER TROUT HARVEST BEGINS FEB. 1

MDC Fisheries staff have stocked more than 80,000 rainbow trout in urban-area lakes around the state for winter trout fishing. Many of these areas allow anglers to harvest trout as soon as they are stocked, while other areas are catch-and-release until Feb. 1. Find locations at short.mdc.mo.gov/ZF3.

Beginning Feb. 1, all urban-area lakes allow the harvest of trout. The daily limit at these locations is four trout with no length limit. All Missouri residents older than age 15 and younger than age 65 must have a fishing permit. All

nonresidents over age 15 must have a fishing permit. To keep trout, all anglers regardless of age must have a Missouri trout permit.



MDC Fisheries staff stock urban lakes with trout every year. Learn more about trout fishing at mdc.mo.gov/fishing/species/trout.



Joe Miller harvested this bull elk in Carter County during the archery portion of the elk hunting season. The other two elk were harvested in Shannon County during firearms portion.

THREE ELK HARVESTED DURING 2022 SEASON

Missouri hunters harvested one bull elk during the archery portion of the 2022 elk hunting season, Oct. 15–23, and two bull elk during the firearms portion, Dec. 10–18. The three Missouri hunters were each selected for one of five elk permits issued in 2022 through a random drawing of 9,684 applicants.

Elk are a native species in Missouri but were extirpated in the state in the late 1800s due to unregulated hunting. Missouri's first elk hunt in 2020 came after years of restoration efforts by MDC, numerous partners including the Rocky Mountain Elk Foundation, and many supporters including local communities and area landowners. Learn more about elk at short.mdc.mo.gov/4xD. Learn more about elk hunting in Missouri at short.mdc.mo.gov/Ztb.

WHAT IS IT? NORTHERN BOBWHITE TRACKS

Take a hike this winter and see how many tracks you can find in the snow. One of those tracks may belong to a northern bobwhite. These ground-dwelling quail live in coveys and peck and scratch near and underneath the brushy cover they prefer. Their calls — *bob-WHITE* — carry a long distance, so you may hear them before you see their tracks. MDC is helping reverse declining populations through public education, recreation opportunities, and landowner assistance.



FLYING *High*

PROTECTIONS,
RESTORATION
BOOST BALD EAGLE
RESURGENCE

by Larry Archer



Positioned roadside along Loess Bluff National Wildlife Refuge's (NWR) Snow Goose Pool, Dale Garrett stood patiently — outfitted in insulated overalls and trapper hat to protect himself from the sub-freezing wind chills — with his telephoto lens trained on a lone juvenile bald eagle perched in a nearby tree, waiting for the bird to take flight.

"It's great today," Garrett said of the photography opportunities. "I mean, we're getting some pretty nice shots ... there's three or four or five eagles out there right now hunting for ducks."

With his wife, Kay, who is also a photographer, Garrett made the trip from his home in Mountain View, Arkansas, to spend several days at Loess Bluffs NWR near Mound City in northwest Missouri. At 64, Garrett





Loess Bluff National
Wildlife Refuge

PHOTOGRAPHS BY
LARRY ARCHER

As water freezes in northern states, increasing numbers of bald eagles make their way to Missouri, where open water remains available. Even partially frozen water allows eagles to hunt for fish and waterfowl, but the increasing numbers result in birds competing for food.



can remember a time when the single eagle in the tree might have warranted such a drive to see, but today, Loess Bluffs NWR is one of several areas of Missouri where one might — on the right day — observe hundreds of bald eagles on the landscape.

DECLINE OF A NATIONAL SYMBOL

In 1782, when Congress adopted the Great Seal of the United States — featuring the bald eagle with wings outstretched — as the national symbol, there was an estimated 100,000 nesting pairs of bald eagles in the continental U.S. By 1963, that number had fallen to 417.

While much is made of the effect that dichlorodiphenyltrichloroethane (DDT) — a synthetic insecticide developed in the 1940s — had on eagle populations in the mid-20th century, the bird's plight began both nationwide and in Missouri nearly a century earlier, according to MDC Avian Ecologist Janet Haslerig.

"You have to remember that with DDT, it affected, of course, bald eagles and other raptors," Haslerig said. "But in Missouri, that impact wasn't quite there for bald eagles. Our decline was before DDT."

Habitat loss, the indiscriminate killing of eagles — which were thought by some to be a threat to livestock — and the overharvest of the waterfowl on which the bald eagle commonly

preyed combined to take a toll on bald eagle populations beginning as early as the mid-19th century. By 1890, the nesting population of eagles in Missouri was virtually non-existent.

The introduction of DDT, which contributed to the diminishing success of eagle reproduction, was the final blow that pushed the eagle to the edge.

STOPPING THE SLIDE

Even before the introduction of DDT, conservationists had noted the plight of the bald eagle and steps were underway to reverse the trend. In 1940, Congress passed the Bald Eagle Protection Act, which prohibited selling, killing, or possessing a bald eagle. The act was later amended to include the golden eagle and renamed the Bald and Golden Eagle Protection Act. The amendments expanded the types of protection provided, including a prohibition against owning parts of the birds, their nests, or eggs.

The early 1970s saw two significant developments in the protection and resurgence of bald eagles: the Environmental Protection Agency ban of DDT in 1972 and the inclusion of the bald eagle for protection under the Endangered Species Act. Federal protections and the ban on DDT helped stop the decline in eagle numbers, but it would take more to restore the population.

THE JUMPSTART

Simply addressing the threats that had faced eagles for nearly a century helped but stabilizing the eagle population would take a more direct approach. The U.S. Fish and Wildlife Service (USFWS) and state conservation agencies across the country began captive breeding and restoration programs in the 1980s. In Missouri, MDC partnered with USFWS and Dickerson Park Zoo in Springfield to release 74 young bald eagles at Mingo National Wildlife Refuge, located near Puxico in southeast Missouri, and Schell-Osage Conservation Area (CA) near El Dorado Springs in west-central Missouri. The effort proved to be the needed springboard for reestablishing a nesting population in Missouri, Haslerig said.

"I think that reintroduction jumpstarted the increase in population," she said. "From 1980 to 1991, we banded 74 eaglets and released those. And I think that was the jumpstart, because when you do that, those eagles are going to return to that general area to nest. So that was the beginning."

From that beginning, both in Missouri and nationwide, the resurgence began. In 1982, Missouri documented its first successful nest at Truman Lake, just east of Schell-Osage CA. In 2007, the bald eagle was removed from Endangered Species Act protection, although it remains a protected species under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

MDC surveys from 2006 through the present have documented a steady growth in the number of nesting pairs in the state, increasing from 123 active nests in 2006 to 630 nests in 2022. In 2021, USFWS released a study estimating a total eagle population in the lower 48 states of 316,700 eagles, including 71,467 occupied nests.



A wildlife biologist bands bald eaglets at Mingo National Wildlife Refuge in 1992.



Who's Watching the Nest?

A childhood interest in bald eagles and other raptors has followed Jon Wilson into adulthood, but it was the rollout of the Eagle Watch Program, an MDC citizen science program that allows the department to better track the status of Missouri's more than 580 known active eagle nests, that he found his way to contribute to the continued resurgence of the eagle in Missouri.

"I was always really fascinated with them, they're just a beautiful bird, very unique," Wilson said. "And so, when this program came up, it gave me an opportunity to do something more effective toward helping out the eagle cause."

Program volunteers monitor assigned nests, with their finds used by MDC staff to determine bald eagle population and productivity trends. Monitors collect information on whether a nest is active, whether young are produced, and whether those young fledge.

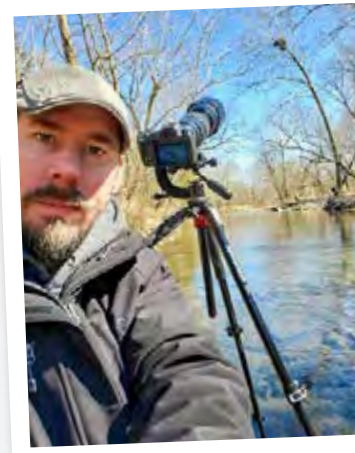
Established in 2018, the program was born of necessity — the number of nests was overtaking the number of MDC staff available to keep tabs on them, said MDC Avian Ecologist Janet Haslerig, who coordinates the program.

Wilson was one of the first volunteers involved with the program, but most of the inaugural watchers were from Master Naturalist chapters from around the state, Haslerig said. Now, there are roughly 250 observers monitoring between 475 to 500 of Missouri's estimated 587 active eagle nests.

While many program participants are assigned a single nest, Wilson, 40, of Marshfield, exceeds the average considerably, monitoring nests in eight to 10 counties in southwest Missouri.

"I've logged over 50 nests in southwest Missouri," he said. "But they don't always nest every year, so any given time, maybe 30 every year are active, and I find some. This season I found three more, so they're constantly popping up different places."

Additional information on the program is available online at mdc.mo.gov/eagle-watch-program. People interested in getting involved in the program can reach out to Haslerig at EagleWatch@mdc.mo.gov.





Golden eagle



Bald eagle



Juvenile bald eagle

Golden Eagles

At its peak, an estimated 2,500 bald eagles will make Missouri their temporary winter home. Occasionally, the experienced birding eye might spy the far less common golden eagle among those numbers.

Annual waterfowl counts, which also include eagle populations, will typically pick up the occasional golden eagle, said MDC Avian Ecologist Janet Haslerig.

"We're one of the top states that have a big influx of bald eagles and with that comes golden eagles," Haslerig said. "I always like to see how many golden eagles. It could be from one to 10 golden eagles in the state to be picked up during that survey."

The January 2022 waterfowl survey identified 15 golden eagles.

With a year-round range that primarily encompasses western states, the golden eagle's winter range will occasionally include a visit to Missouri. Being similar in size to the bald eagle, and lacking the distinctive markings of the bald eagle, the golden eagle can be confused for juvenile bald eagles to the inexperienced birder.



Eagles compete for the fresh catch of the day. Open water provides ideal hunting grounds for eagles.



THE VISITORS

As the nesting population of eagles continues to grow, Missouri also sees an influx of visitors each winter — migrating eagles in search of food no longer available in the frozen north. Missouri's abundance of non-frozen waterbodies draws the birds. The presence of open water means access to fish and waterfowl, two of the eagle's main food sources, Haslerig said.

"We've got open water," she said. "We've got Truman, we've got Bagnell Dam, we've got a lot of water spaces that stay open in the wintertime, and that's the main thing that they need is a water source for food."

Between nesting pairs and migrating birds, Missouri's winter eagle population averaged roughly 2,500 birds between 1993 and 2022 but swelled to nearly 3,700 in January 2022, she said.

As with many things, the weather plays a big part in Missouri's eagle population. The earlier and harder the freeze in northern states, the larger the eagle count here, said Darrin Welchert, wildlife biologist at Loess Bluffs NWR.

The refuge has a 20-year average of approximately 235 eagles during the peak, but a January 2022 survey estimated more than 830 eagles on the refuge.

"The numbers come up and down, but there's a lot of things that factor into that," Welchert said. "It kind of depends on the year, and a lot of that has to do with the waterfowl migration and what the freezing conditions are farther north of us."

A HOTSPOT

Not far from where Dale and Kay Garrett were stopped at Loess Bluffs NWR, Fred and Pam Hummelsheim had pulled over, their cameras trained on an eagle nest across the road from Snow Goose Pool. Pam eschews the word "experienced" to describe their birding prowess, preferring the more modest "enthusiastic."

But it's that enthusiasm that has taken them as far as Minnesota in search of owls and prompted them to pass several known eagle hotspots on their drive from their home south of St. Louis to Loess Bluffs NWR.

"It's great, we like it," Fred said. "There's not many areas in the Midwest like this where you can do this, you know?" ▲

Larry Archer is associate editor of Missouri Conservationist. He and his wife, Kathy, are Eagle Watch Program nest monitors.



Threats That Remain

The resurgence of the bald eagle is often and appropriately lauded as one of the great American conservation wins for wildlife. From near extinction to nationwide restoration, the eagle story is one of success, but even now, bald eagles face threats to their survival. MDC Avian Ecologist Janet Haslerig identified the eight most common threats to bald eagles:

Illegal shooting – Despite enjoying both widespread public admiration and state and federal protections, cases of people shooting bald eagles still exist.

Lead poisoning – Eagles are scavengers, and as such, frequently ingest game that has been shot with lead bullets or pellets.

Habitat loss – Continued urban expansion displaces eagles and disrupts their reproductive processes.

Powerline electrocution – The electricity we use has to get from the source to the end user, which can often lead to conflict with eagles.

Vehicle collision – As scavengers, eagles can be frequently seen roadside taking advantage of roadkill and putting themselves in harm's way with passing traffic.

Climate change – The National Audubon Society estimates that by 2080 climate change, including more frequent drought, damaging winds, and extreme heat, could reduce the bald eagle's summer range to only 26 percent of its current size, shifting virtually all the eagle's breeding range to Alaska and Canada.

Wind turbines – Considered a source of renewable energy, wind turbines, with their long, spinning blades, are also a threat to bald eagles, other raptors, and birds.

Disease – Wildlife diseases, such as avian influenza, affect eagles as well as waterfowl and other raptors.

More information on eagle viewing and Eagle Days events is available online at mdc.mo.gov/events/eagle-days.



A close-up photograph of a chocolate chip cookie, which serves as the background for the entire page. The cookie is golden-brown with numerous dark chocolate chips. On the right side of the cookie, a small, reddish-brown tick is visible, partially embedded in the surface. The title 'Show-Me Ticks' is overlaid in large white letters.

Show-Me Ticks

CITIZEN-SCIENCE STUDY UNCOVERS THE
LOCATION, BACTERIA OF MISSOURI'S TICKS

by Angie Daly Morfeld



Lone star tick
PHOTOGRAPH BY
JIM RATHERT

A four-day Fourth of July weekend spent at a friend's property in 2005 launched a 17-year journey that David Seyer never anticipated.

That weekend, Seyer, of St. Clair, helped build a hunting cabin on a friend's land in Putnam County, near Mineral Hills Conservation Area. A few days later, Seyer found two ticks embedded on his body. He pulled them off and didn't give it another thought.

Two to three months later, he began having unusual symptoms that worsened over time — chronic neck pain and swelling, testicular pain, difficulty walking, irregular heart-beat, bell's palsy, and stomach issues, which lead to an intolerance for meat.

After several trips to a variety of doctors, and a host of misdiagnoses, including being told it's all in his head, Seyer was finally told in 2008 that he has *Borrelia burgdorferi*, the bacteria that causes Lyme disease.

"I was relieved," Seyer said. "I thought, finally a diagnosis. Now, I can start the process of getting well."

Little did he know, the path to wellness was not going to be smooth.

Traditional antibiotics were not working, so he stopped those. He continues to receive massage therapy to keep his lymphatic system moving. He has tried a multitude of experimental treatments, though none of them are covered by insurance. He estimates he and his wife, Wanda, have spent upwards of \$100,000 in search of relief, and he's still in pain.

"Many doctors are just uneducated," Seyer said. "They just don't know. I don't want to see anyone else go through what I am going through."

Though Lyme disease is not common in Missouri, Ehrlichia and Rickettsia diseases are. MDC hopes a recently completed two-year tick study will better inform the public — and the medical community — about ticks and tick-borne illness so stories like Seyer's may be prevented.



American dog ticks hitch a ride on your pets, which is how they enter your homes. Treating your animals protects them and helps reduce your risk of being bitten.



Blacklegged ticks are active in fall and winter. Many are found on harvested deer so remember to check for ticks after hunting.

Ticks Submitted

Lone star tick (*Amblyomma Americanum*)

Gulf Coast tick (*Amblyomma maculatum*)

Bat tick (*Carios kelleyi*)

Winter tick (*Dermacentor albipictus*)

American dog tick (*Dermacentor variabilis*)

Bird tick (*Haemaphysalis chordeilis*)

Rabbit tick (*Haemaphysalis leporispalustris*, *Ixodes banksi*, *Ixodes brunneus* *Ixodes cookie*, *Ixodes dentatus*, *Ixodes marxi*)

Blacklegged/Deer tick (*Ixodes scapularis*, *Ixodes texanus*, *Otobius megnini*)

Brown dog tick (*Rhipicephalus sanguineus*)

Tick-borne Diseases Present in Missouri

Bourbon virus, causative agent: virus

Heartland virus, causative agent: virus

Anaplasmosis, causative agent: *Anaplasmosis phagocytophilum*

Babesiosis, causative agent: *Babesia* species

Human monocytic ehrlichiosis, causative agent: *Ehrlichia chaffeensis*

Human granulocytic ehrlichiosis, causative agent: *Ehrlichia ewingii*

Southern tick-associated rash illness (STARI), causative agent: unknown

Tidewater spotted fever, causative agent: *Rickettsia parkeri*

Rocky Mountain spotted fever, causative agent: *Rickettsia rickettsii*

Lyme disease, causative agent: *Borrelia burgdorferi*

Relapsing fever borreliosis, causative agent: *Borrelia miyamotoi*

Tularemia, causative agent: *Francisella tularensis*

Tick Study

To determine the presence of tick species, and the pathogens they may harbor, MDC, in partnership with A.T. Still University (ATSU), Kirksville, launched a two-year research study in April 2021.

“We knew it would be impossible to hire a crew big enough to collect ticks statewide, so we turned to citizen science,” said Matt Combes, MDC Ecological Health Unit science supervisor. “Citizen science has proven effective for Stream Teams and other projects for years. It allows us to accomplish data collection and disease ecology surveillance at a scale unattainable by scientists alone.”

During those two years, citizens were asked to place live ticks in plastic, zip-top bags with a piece of damp paper towel or moist cotton ball, with a completed sample submission form, found on ATSU’s website. The ticks were then mailed to ATSU where the ticks were identified to species and a subset of those ticks were tested for four genera of bacteria that cause human disease.

Ticks and Disease

Lone star tick, Disease: Ehrlichiosis, Tularemia, STARI, Heartland virus

American dog tick, Disease: Rocky Mountain spotted fever, Tularemia

Blacklegged/Deer tick, Disease: Ehrlichiosis, Relapsing Fever Borreliosis, Anaplasmosis, Lyme disease, Babesiosis, and Powassan virus

Gulf Coast tick, Disease: Tidewater spotted fever

Brown dog tick, Disease: Rocky Mountain spotted fever



These are lone star ticks – a male on the right and a female on the left (with a white dot). This is the species you are most likely to encounter while enjoying nature.



Gulf Coast ticks are relative newcomers to Missouri, so watch out for them across the Ozarks.

In the Lab

Deb Hudman, senior research associate at ATSU’s Microbiology and Immunology Department, received the ticks by mail from counties across the state. Once received, each tick was identified, given a number, and placed in ethanol. Up to 10 individual ticks of four human biting species from each county were tested for bacterial pathogens that infect humans.

Maps were created and updated weekly on the ATSU website so citizens could see in real time where ticks were coming from and their pathogens.

“We were creating a baseline data set,” Hudman said. “Missouri has a diverse and abundant tick population that is poorly understood due to lack of tick surveillance and information sharing. There are many tick-borne human pathogens in the state, but there is no comprehensive map of where tick species occur, or of the human pathogens those ticks are carrying.”

The maps born from this study — a first for the state — will be shared with the Centers for Disease Control and Prevention and the Missouri Department of Health and Senior Services, who will in turn share them with county health departments. This information will help educate local physicians about the ticks found in their area and the disease-causing pathogens present.

“There is a pressing need to increase tick surveillance in Missouri, develop statewide distribution maps of tick species and tick-borne pathogens, and educate the public on reducing their risk of contracting a tick-borne disease based on that data,” Combes said.

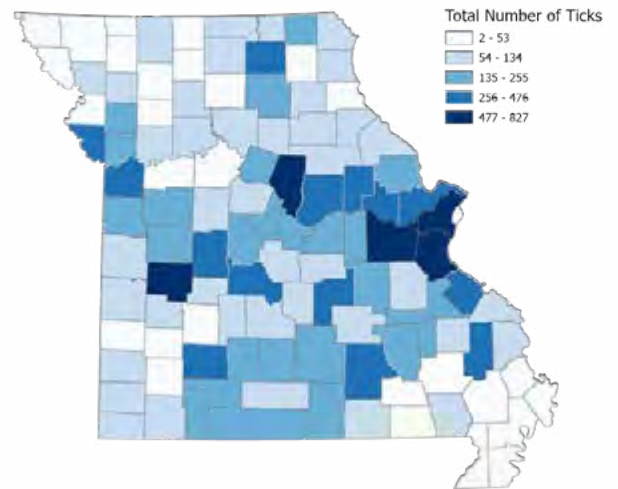
Findings

By the end of the survey period, 17,466 ticks were submitted by citizen scientists. Of those, 71 percent were lone star ticks, 26 percent were American dog ticks, 2 percent were blacklegged ticks, and the remaining 1 percent consisted of five different tick species.

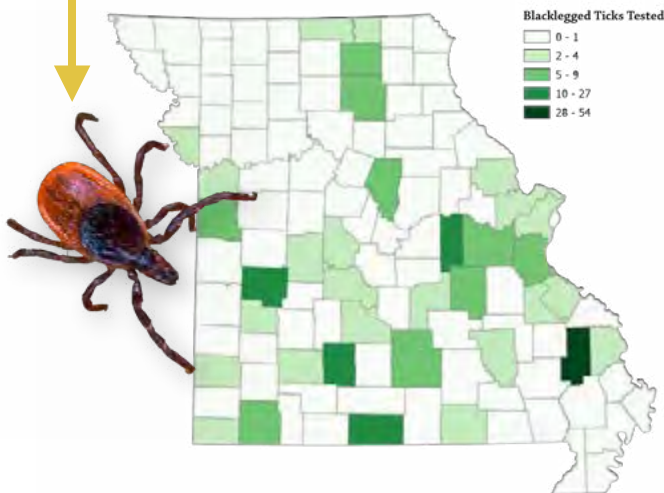
Rickettsia parkeri was detected in 8 percent of the Gulf Coast ticks, anaplasmosis and Lyme disease in combination was found in 3 percent of the blacklegged ticks, ehrlichiosis and tularemia in combination was found in 5 percent of the lone star ticks, and tularemia and *Rickettsia montanensis* in combination was found in 6 percent of the American dog ticks.

So far 2,462 individual ticks have been tested with 134 those testing positive for a human pathogen for an overall infection rate of 5 percent.

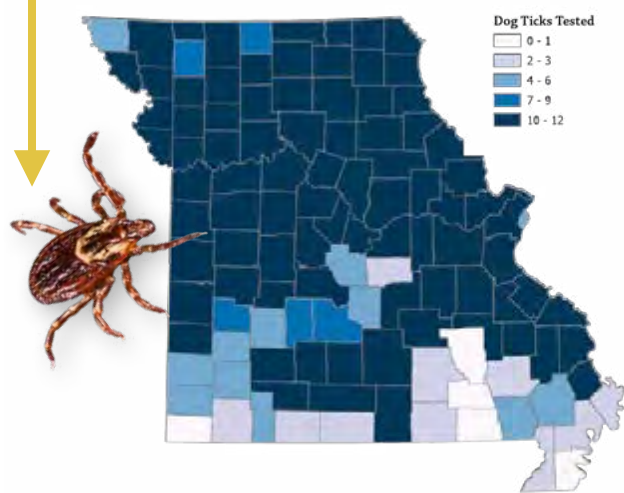
State Testing



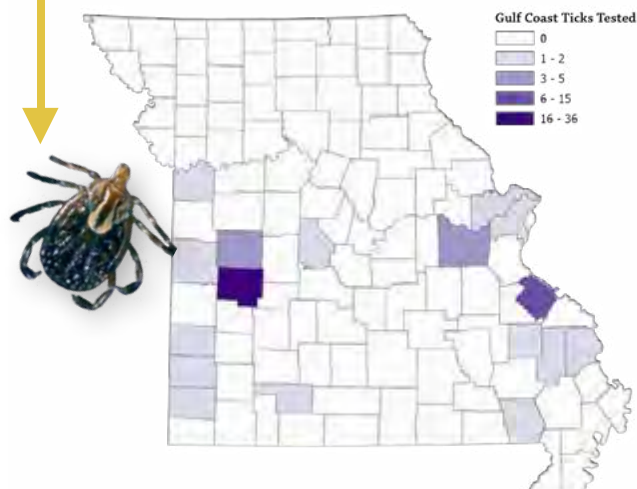
Blacklegged Tick



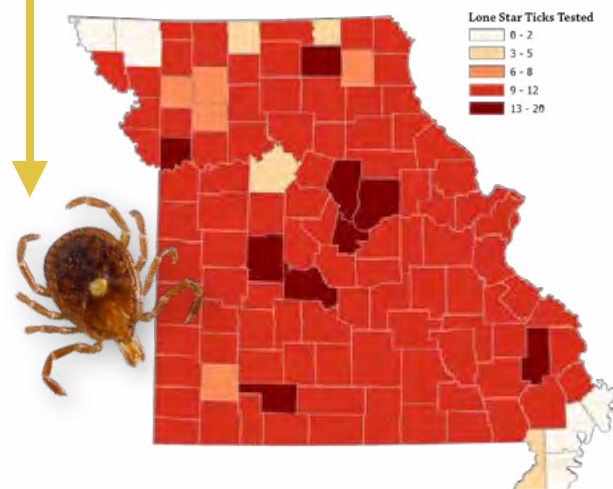
American Dog Tick



Gulf Coast Tick



Lone Star Tick



Medical Care

Ticks do everything they can to go undetected.

“When they bite, they release antihistamines and anticoagulants, and if still undetected they put in a cementing agent to hold themselves in place,” Hudman said.

Ticks ingest blood from a host until they are full. They require three blood meals to complete their life cycle, and with each meal, their chance for acquiring pathogens increases.

If you find a tick attached to you, remove it and stick it on a piece of clear tape. Put it on the calendar on the date you found it. If after 10 days, you feel good, you can throw it away. If you are feeling flu-like symptoms in those 10 days — tired, achy, or see a rash developing — you may have a tick-borne illness. Seek medical advice and take the tick with you.

Prevention is Key

Without a doubt, this study shows ticks are part of Missouri’s landscape. But don’t let ticks prevent you from enjoying the outdoors and your favorite activities. There are things you can do to continue to reap the benefits of nature while avoiding negative interactions with ticks:

- **Use insect repellent.** Spray yourself liberally before heading outside.
- **Dress appropriately.** Light-colored, long-sleeved shirts and long pants are best. For further protection, tuck your pants into your socks. As an added step, look for clothes pre-treated with insecticide.
- **Stay on walking paths.** Don’t venture into heavy vegetation.
- **Check, check, and then check again.** Check yourself outside frequently. Check yourself again as soon as you get home, and then shower. The sooner you remove a tick, the lower your risk of disease.
- **Manage your habitat.** Ticks avoid bare ground and prefer areas with leaf litter. Therefore, keep your land well managed. Look into prescribed burning, mowing, and landscaping.
- **Treat your pets.** Dogs and cats carry ticks and can easily bring them indoors. Prevent this by treating your pets for ticks. ▲

Angie Daly Morfeld is the editor of Missouri Conservationist. She lives in the country and strongly encourages treating your dogs – and kids – for ticks.

Ticks are part of nature, but don’t let them keep you inside. Just take the proper precautions. Use insect repellent, tuck your pant legs into your socks, and always check yourself once returning from your enjoyable trip in the outdoors.

To access the Missouri Tickborne Disease Story Map on the Missouri Health and Senior Services website, visit short.mdc.mo.gov/4f3.



Spring and Summer Hunter's Almanac





A MONTHLY TO-DO GUIDE TO HELP YOU GET THE MOST OUT OF MISSOURI'S HUNTING SEASONS

by **Scott Sudkamp**

Late winter can foster the blues for the outdoor enthusiast. Most of the hunting seasons have ended, and the dormant plants, gray skies, and cold temperatures offer an often-bleak landscape. But the days are getting longer. Shortly, the first green buds will appear on the trees, and activity will increase in the finned and furred animals we love to pursue. Soon enough, we'll enjoy a tug on the end of the line, a pulse racing as a turkey thunders and struts into range, and the sizzle and smell of fresh morels hitting hot oil.

Springtime in Missouri is a special time. We experience the resurrection of the prairies and deciduous forests, the raucous gobble of a mature tom proclaiming daybreak from a sycamore limb, and the emergence of black bears and groundhogs from their winter dens. Is there another time that colors seem more vibrant than those of the first pink redbud blossom or Indian paintbrush flower? Don't we wish chilly mornings and warm afternoons were in the forecast all year long? Over thousands of years, Missouri's climate has shaped her flora and fauna, resulting in a resplendent array of colors, textures, sounds and smells, many of which announce the arrival of spring and summer to come.

While hunting seasons may be for the most part closed, there still are plenty of activities for those who love the outdoors. Whether it be scouting to inform future hunting opportunities, managing habitats to better support the animals we love, or just taking a hike to enjoy and experience all nature has to offer, there's lots to do for those willing and able to get outside. The following are some activities that hunters and outdoorspeople might consider as we come out of winter and into spring.

PHOTOGRAPH BY
NOPPADOL PAOTHONG

March

- Take advantage of nice days this month and go on a hike and look for shed antlers. Take a moment to explain to those not familiar that cervid antlers are the fastest growing bone in the animal kingdom.
- What to do on a frosty March morning? Set up a predator caller and see if you can coax in some coyotes. They're smart and wary, so set up downwind and stay still. Late winter fur should be prime.
- Grab a cup of coffee and head outside at daybreak to listen for turkeys gobbling. Around midday, stroll down to where you heard them gobbling and look for feathers and scat to determine where they like to strut. Put a trail camera out to confirm your investigation.
- Get your wood duck boxes ready for nesting hens. Remove old nests and place 4 inches of wood shavings in the bottom of the boxes.
- Frost seed some clover now to provide nutritious forage later.
- Want to enjoy the sights and sounds of Missouri's state bird? Go to **short.mdc.mo.gov/4x8** for plans and materials list for building a bluebird house. Put them up this month.
- Beaver populations are thriving, and trapping season runs through the end of the month. Set some traps to catch a few of North America's largest rodent
- Willow hooped beaver pelts make great decor for home or cabin. There are plenty of DIY videos online that will walk you through hooping a beaver hide.
- Running a chainsaw is a great way to stay warm on a cold day. Talk to your local forester about the benefits to woods and wildlife from timber stand improvement.
- Heavy sod grasses inhibit plant diversity necessary for many wildlife species to thrive. A few weeks after green up is a good time to spray or disk fescue to promote more plant diversity.



April

- Scout for turkeys. Large trees near streams are likely roost sites. J-shaped droppings indicate a gobbler or jake, while coiled scat come from a hen.
- Whether you plan to turkey hunt with gun or bow, early April is a great time to ready your gear. Archery hunters should dial in their bow sights for close shots and shotgun hunters should pattern their guns using the same loads and choke they'll use during the season.
- Morel mushrooms should peak this month. Keep a sack in your pocket and keep your eyes open in the woods. Dead ash and elm trees are likely spots.
- Hunting isn't just about the kill. Take a young person out to help look for turkey sign. Draw up a list of things to look for and make it a treasure hunt!
- Building a ground blind together can be just as fun as building a fort. It's even more fun if they can shoot a turkey from the blind they helped build.
- Ticks will be in full force this month. Treat your clothes and check for these pesky arachnids when you come inside.
- Set a goal for the April trifecta — shoot a turkey, catch some crappie, and find some morels all on the same day.
- Want a great place to hunt doves in September? Now's the time to plant sunflowers. Good site prep is critical.



May

- Now that we're past the last frost, go ahead and plant those summer food plots that are sensitive to freezing temperatures.
- Take some soil tests for areas you plan to plant food plots. If your pH is low, apply lime and incorporate it now to bring it up in time for fall planting.
- Squirrel season opens right around Memorial Day. Stalking the woods builds hunting skills, and shooting bushytails with a .22 hones marksmanship.
- Take a kid or friend fishing for crappie or bluegill. Then fire up the cooker and fry up some filets.
- Missouri has more than 2,000 miles of floatable streams, including many that are nationally renowned. Grab some paddles and enjoy a few days on the water. Don't forget your fishing pole!



By the end of May, both temperatures and humidity levels are usually high, prompting many Missourians to seek activities that help them keep cool. Although most hunting seasons are still months away, there are still plenty of outdoor activities to enjoy. Dehydration is a very real threat for people and pets, so plan activities for the cooler mornings and evenings, and keep your water intake high. Watch the forecast for summertime cold fronts following a storm and take full advantage of the day or two of cooler weather that comes along in its wake. Venomous snakes and stinging insects are another summertime hazard, so learn what areas they inhabit and take care to watch where you step and walk. Know what to do if you or a friend is bitten or stung. Being well prepared and educated allows you to continue your outdoor recreation throughout the year.

Water activities are a great way to spend time outside during the dog days of summer. Many of our Ozark streams have substantial spring flows, which keeps the water cool. Floating or wade fishing these streams offers plenty of opportunity to enjoy nature, whether roll casting a streamer to a hungry trout, or chugging a Jitterbug across the surface at dusk in hopes of enticing a strike from a big bass. And after all the fun of catching these fish, you'll get just as much enjoyment out of sharing them fried to a golden crust with family and friends.



June

- Summer days can be dangerously hot for your canine companion. Exercise your hunting dogs in the early morning or take them to the lake for a swim.
- Bobwhites can be heard calling in the early morning hours.
- Head out to an MDC shooting range for a round or two of skeet shooting or some practice with your hunting rifle.
- Looking for a new skill? Learn how to reload ammo. MDC's range staff can help.
- Fawns are getting big enough to start feeding with their mothers. Bucks' antlers are growing rapidly.
- Got bugs? Young birds, including turkey poults and quail chicks, rely heavily on insects for the protein necessary for rapid growth. Diverse habitats offer lots of food. Visit with a biologist or conservation agent to learn how to promote better brood habitat. Find yours using the phone numbers provided on Page 2.
- Get back to the basics. Grab a cane pole and some crickets and drop a line up under a willow tree. You'll be surprised how much fun this old-time fishing technique can be.



July

- Bullfrog season is open. Get out after dark and harvest some wild frog legs.
- Japanese millet can mature in 60 days. Sow millet on exposed mud flats now to provide seed to migrating ducks in a few months.
- Too stiflingly hot to do much outside? Sit down with a map of your property and sketch out some habitat improvements. Cost share may be available for your habitat projects.
- Celebrate the Fourth of July with some marinated and grilled wild game. Invite friends and family to shoot some clay pigeons after the feast, then settle in to watch the fireworks and celebrate our freedoms.
- Get out after some summer rains and look for edible mushrooms. Puffballs, chanterelles, and chicken of the woods are growing now.
- Looking to stay out of the sun? Set some trotlines or juglines at dusk, then enjoy the cooler night air pole and line fishing for blue cats, channel cats, and flatheads.



August

- Acorns should be big enough to see. Head to the woods with some binoculars and scout for those trees with lots of mast. White oaks heavy with acorns will attract lots of deer soon.
- Early August plantings of turnips and radishes usually allow these plants to grow and fill in well before deer season.
- Smartweed is in full bloom. Head out to your favorite wetland and take note of these patches for duck hunting success in a few more months
- Plan right now for backstraps later — hang your tree stands in anticipation of the upcoming archery season. Don't forget your safety harness!
- Plan a clean-up day! Dump your decoy bag out in the yard and wash the dust and dirt off those decoys so they're ready for teal season.
- Got plans to seed some native grasses and forbs this winter? Good site prep now will help them get off to a good start next year. Contact your private land conservationist for help.
- Dove and teal seasons are right around the corner. Practice busting clays now for a heavier bag next month.



While most outdoorspeople look forward to the months that end in “r,” there’s no reason to stay inside during those that don’t. For those new to hunting and fishing, as well as for those with decades of experience, Missouri offers plenty of opportunities to get out and enjoy its natural resources. With so many great activities available, it would be a shame not to take advantage of them. No one relives the excitement of an afternoon spent on the couch, so get outside. It’s good for your health and it’s good for your soul. ▲

Scott Sudkamp spent 19 years as a wildlife biologist in Missouri and Texas. He currently works as a land agent for Midwest Land Group, where he uses his biological background to help clients better understand the land’s capabilities and develop its potential. He’s a self-described nature nerd and enjoys hunting, fishing, floating, and managing habitats.

Get Outside

in FEBRUARY



Turkey track

→ Ways to connect with nature

Ready the Poles

Have your fishing poles been on pause since before the temperatures dipped below freezing? If so, dust them off and get them out! MDC stocks rainbow trout in certain lakes and streams in winter. In February, trout anglers are getting ready for the big annual March 1 trout park opener. After a winter of being limited to catch-and-release fishing at these popular trout parks, trout anglers look forward to being able to keep their catch. If trout is not your fish, we have you covered. Bass, crappie, walleye, and catfish are some of the fish anglers go after in Missouri winters. For more information on fishing in Missouri, visit mdc.mo.gov/fishing.



Track Hunter

Suffering from cabin fever? Get outside! There's plenty to do in the woods right now. You don't have to wait for spring. After a fresh snow, bundle up in layers and head out. Look for animal tracks in the freshly fallen snow. Take family or friends and make it a game. Who can find the most tracks? Who can correctly identify the tracks? To help you plan the day, visit short.mdc.mo.gov/Ztw.

Chipmunks on the Loose

Eastern chipmunks are small, ground-dwelling squirrels. These beautiful little mammals are active and fun to watch because they can be easily seen in the daylight. Chipmunks have varied hibernating schedules — some are completely dormant in winter while others are active during mild days and still others are active all winter. Regardless of their preferred hibernation schedule, chipmunks start coming out by the end of the month to begin their breeding period. Watch for them scurrying near wooded banks, stone piles, shrubbery, and old outbuildings.



Eastern chipmunk

Natural Events to See This Month

Here's what's going on in the natural world.



Watch for mourning doves' courtship flights.



Listen for spring peepers.



Look for harbinger of spring, one of the earliest-blooming wildflowers.

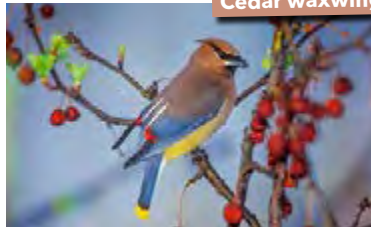
Birds of a Feather

If you are a bird lover, get your binoculars ready. From songbirds to waterfowl and everything in between, birds are getting active, returning, or migrating through this month. Here are just a few birds to watch out for:

- **Cedar waxwings** flock to feed on cedar berries and other fleshy fruits.
- **Northern pintails and mallards** migrate north.
- **Geese** migrate through Missouri.
- **Northern cardinals** sing on sunny days.
- **Eastern screech-owls** search for mates.
- **American robins** return in large flocks.
- **American woodcocks** begin courtship in southern Missouri. Listen for their nasal *peenting* at dusk in brushy fields.

For more information about birds and birdwatching, visit short.mdc.mo.gov/45U.

Cedar waxwing



Northern pintail



Canada geese



Northern cardinal



Eastern screech-owl



American robin



American woodcock



Watch for mourning cloak butterflies on warm days.

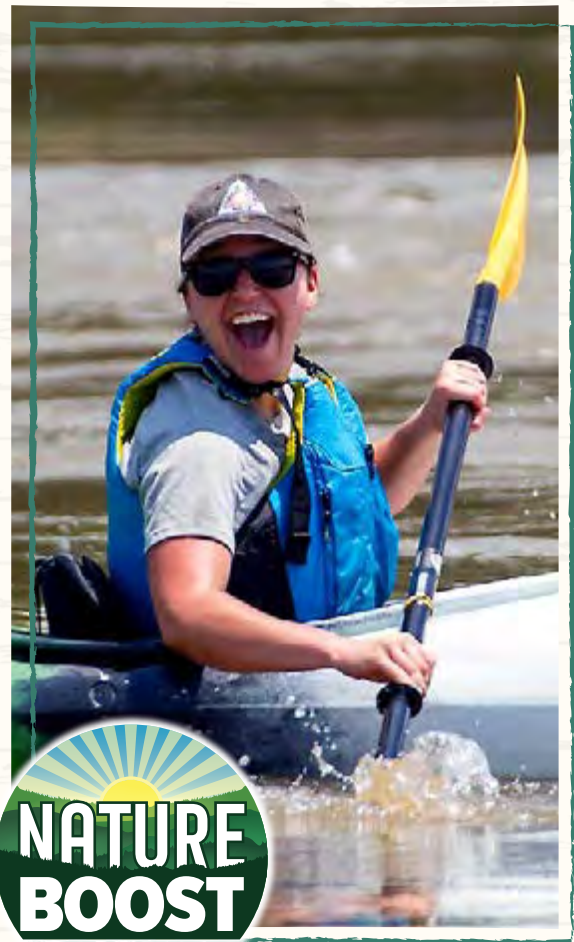


Listen for coyotes howling during the mating season.



RECONNECT WITH NATURE

Interested in exploring the outdoors but unsure where to start? The **Nature Boost** podcast with host Jill Pritchard covers everything from natural health benefits to outdoor recreation.



Download the podcast at mdc.mo.gov/natureboost

Places to Go

CENTRAL REGION

Lamine River Conservation Area

An area of transition

by Larry Archer

✧ Just as it straddles the line between Cooper and Morgan counties, Lamine River Conservation Area (CA) also straddles the divide between Missouri's Ozarks and prairie lands.

Located on just over 6,000 acres, the Lamine River, from which the area gets its name, exhibits elements of both Ozark and prairie waterways, said MDC Wildlife Biologist Travis Henry.

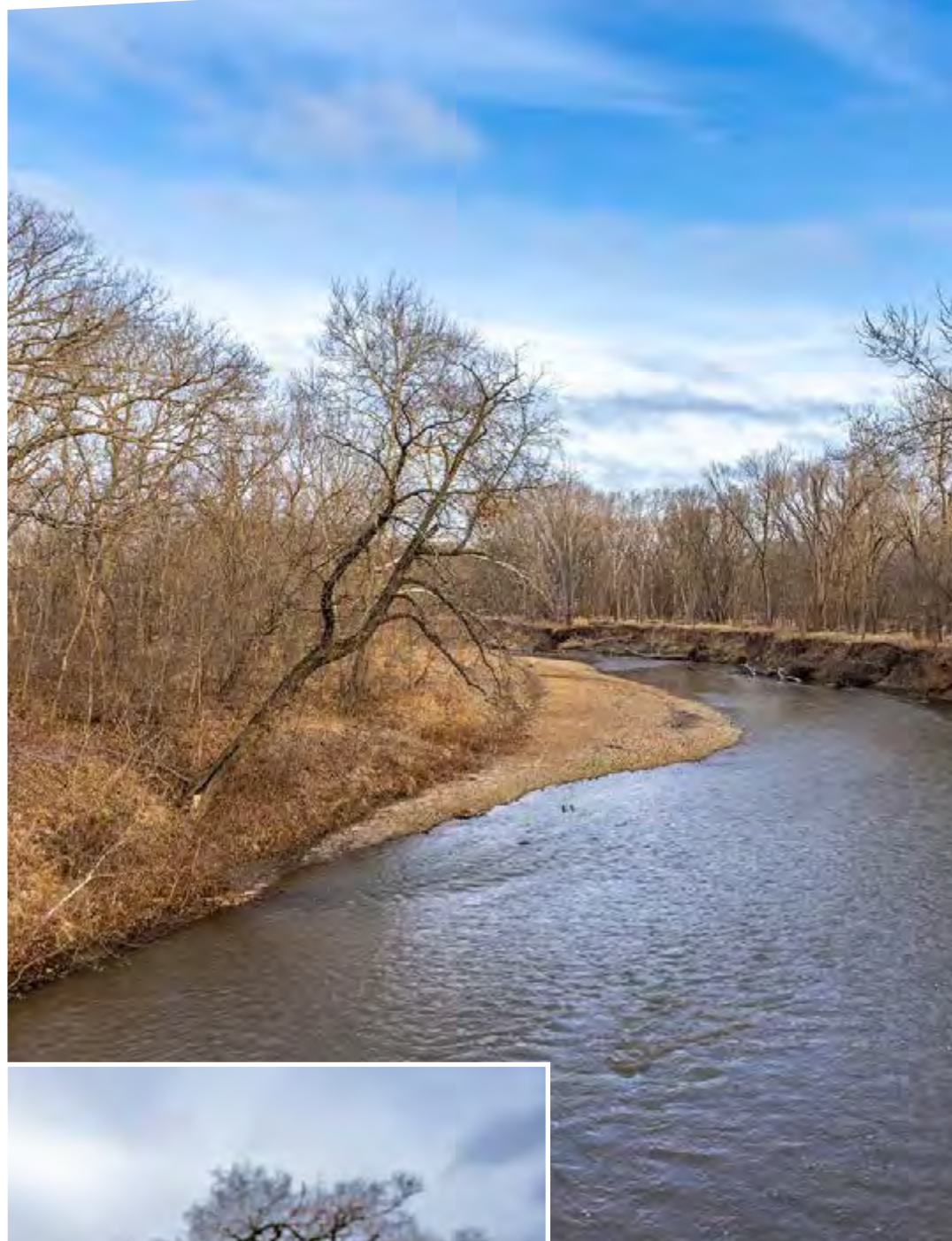
"Flat Creek and Richland Creek come together to make the Lamine," Henry said. "Richland Creek is an Ozark stream, and Flat Creek is a prairie type stream, so the Lamine becomes kind of a gravelly bottom river, but then it has these big wide muddy holes, too."

The river provides fishing opportunities for anglers, but it's not the only place on the area to wet a line.

"We have five ponds on the area that are open to fishing," he said. "They are stocked regularly with catfish."

Usage in February is light, but anyone wishing to spend a quiet day hiking the nearly 20 miles of mowed access trails is likely to be rewarded with a bald eagle sighting, Henry said.

"I think we've got a nesting pair that have built nests on the area over the last couple of years," he said.



"It's just going to be pretty countryside in February. You know, if the snow is on, it's really pretty."

—Wildlife Biologist
Travis Henry

NORPADOL PAOTONG



The Lamine River exhibits elements of both Ozark and prairie waterways. Inset photo: An oak tree stands near one of Lamine River Conservation Area's five fishing ponds.



LAMINE RIVER CONSERVATION AREA

consists of 6,018.9 acres in Cooper and Morgan counties. From Otterville, take Route A east 1 mile. Highway 50 at the Lamine River provides access.

38.702, -92.9799

short.mdc.mo.gov/4Gp

573-796-0286

WHAT TO DO WHEN YOU VISIT



Biking Includes 19.5 miles of service roads open year-round to biking.



Birdwatching Included in the Great Missouri Birding Trail (short.mdc.mo.gov/4Gc). The eBird list of birds recorded at Lamine River CA is available at short.mdc.mo.gov/4Gq.



Camping Designated camping sites.



Fishing Black bass, catfish, sunfish.



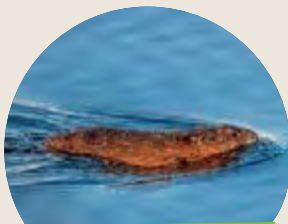
Hunting Deer and turkey Regulations are subject to annual changes. Refer to MDC's regulation page online at short.mdc.mo.gov/Zjw.

Also **quail, rabbit, and squirrel**.



Waterfowl Hunting Open hunting.

WHAT TO LOOK FOR WHEN YOU VISIT



Muskrat



American kestrel



Barred owl



American woodcock



Rainbow Trout

Oncorhynchus mykiss

Status	Size	Distribution
Small self-sustaining populations; continuous stocking	Total length: 10–15 inches; weight: to 1½ pounds (or more)	Ozark spring branches, spring-fed streams, Lake Laneycomo

Rainbow trout require waters that are constantly below 70 degrees. MDC operates trout hatcheries in order to stock them as game fish in our state. Though not native, trout have established self-sustaining populations, and creel and size limits help keep those populations healthy. Rainbow trout have small scales and a small, fleshy fin on the back behind the dorsal fin. The fins lack spines. Upper parts are dark olive, thickly speckled with black spots; the belly is silvery white. There are prominent dark spots on the tail and a pink or reddish longitudinal stripe. The tail fin is forked.



FOODS

Rainbow trout eat a variety of animal life, but aquatic insects, terrestrial insects, snails, and small fishes often make up the bulk of its diet.



LIFE CYCLE

Wild trout spawn in late December through early February. The female digs a shallow pit on clean, gravelly riffles, fanning it with her tail. One or more males fertilize the eggs as they are shed. The female resumes digging upstream, covering the eggs with gravel carried by the current. No parental care is provided. Hatchery brood stock spawn in October and November. Hatchery-raised trout grow faster than those in the wild, reaching 10 inches their first year.



HUMAN CONNECTIONS

There is a tremendous and growing demand for trout fishing in Missouri, so trout are raised in hatcheries and released into suitable habitats to meet the demand. Trout angling-related activities contribute millions of dollars to Missouri's economy annually.



Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zib. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.

Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at short.mdc.mo.gov/Zi2.



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Keep:
May 28, 2022–Feb. 28, 2023
- ▶ Catch-and-Release:
March 1–May 26, 2023

Nongame Fish Giggling

Streams and Impounded Waters,
sunrise to midnight:

Sept. 15, 2022–Feb. 15, 2023

Impounded Waters, sunrise to sunset:
Feb. 16–Sept. 14, 2023

Paddlefish

Statewide:

March 15–April 30, 2023

On the Mississippi River:

March 15–May 15, 2023

Sept. 15–Dec. 15, 2023

Trout Parks

During the catch-and-release season,
state trout parks (except Maramec Spring
Park) are open only Friday–Monday.

Catch-and-Release:

Nov. 11, 2022–Feb. 13, 2023

Catch-and-Keep:

March 1–Oct. 31, 2023

Bobcat, Opossum, Raccoon, Striped Skunk

Nov. 15, 2022–Feb. 28, 2023

Coyote

Restrictions apply during April, spring turkey season,
and firearms deer season.

Open all year

Crow

Nov. 1, 2022–March 3, 2023

Deer

Archery:

Sept. 15–Nov. 10, 2023

Nov. 22, 2023–Jan. 15, 2024

Firearms:

- ▶ **New!** Early Antlerless Portion
(open areas only): Oct. 6–8, 2023
- ▶ Early Youth Portion (ages 6–15):
Oct. 28–29, 2023
- ▶ November Portion:
Nov. 11–21, 2023
- ▶ **New!** CWD Portion (open areas only):
Nov. 22–26, 2023
- ▶ Late Youth Portion (ages 6–15):
Nov. 24–26, 2023
- ▶ Late Antlerless Portion (open areas only):
Dec. 2–10, 2023
- ▶ Alternative Methods Portion:
Dec. 23, 2023–Jan. 2, 2024

Rabbit

Oct. 1, 2022–Feb. 15, 2023

Squirrel

May 28, 2022–Feb. 15, 2023

Turkey

Archery:

Sept. 15–Nov. 10, 2023

Nov. 22, 2023–Jan. 15, 2024

Firearms:

- ▶ Youth (ages 6–15): April 1–2, 2023
- ▶ Spring: April 17–May 7, 2023
- ▶ Fall: Oct. 1–31, 2023

Waterfowl

See the Migratory Bird and Waterfowl
Hunting Digest or visit short.mdc.mo.gov/ZZx for
more information.

TRAPPING

Beaver, Nutria

Nov. 15, 2022–March 31, 2023

Bobcat, Coyote, Mink, Muskrat, Opossum, Raccoon, River Otter, Striped Skunk

Nov. 15, 2022–Feb. 28, 2023

New! Special Trapping Season for Private Lands Only: Coyote, Opossum, Raccoon, Striped Skunk

March 1–April 14, 2023

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Follow the lead of this nine-banded armadillo and take a walk this month. Get out there and discover a new conservation area! This armadillo is exploring the grasslands at Wah'Kon-Tah Prairie. Where will you go to shake off the winter blues?

📷 by **David Stonner**

Free to Missouri households

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